

Successes and Challenges for the Oil Program

W.F. Lawson
Director, National Petroleum Technology Office
U.S. Department of Energy

Distinguished guests, ladies and gentlemen, good morning. It is a great pleasure to join with the Federal Energy Technology Center (FETC) and our Fossil Energy Headquarters in sponsoring the first DOE Joint Oil and Gas Conference. I am delighted to report over 230 people in attendance.

The National Petroleum Technology Office enjoys more and more benefits working with FETC than ever before. I would like to recognize Rita Bajura and her organization for their great support of our office. Thank you, Rita.

The technical presentations you will hear in the next few days were selected for the success and state of development of the projects they describe. Assistant Secretary Gee has already mentioned our pride about the 1999 Hart's Oil and Gas World awards. One of the presentations on the agenda is an awardee: The Best Advanced Recovery Project of the Gulf Coast by Hughes Eastern Corporation of Jackson, Mississippi, who used microflora in oil-bearing formations to selectively plug porous zones to increase oil recoveries in Alabama.

Three other DOE projects not represented on the agenda but 1999 Best of the Regions winners, also, are the Best Field Improvement Project of the Pacific by Tidelands Oil Company who, with the City of Long Beach, developed a lower-cost hydrogen sulfide caustic scrubber program in Southern California; the Best Advanced Recovery Project of the Pacific by the University of Utah who developed a technique which restored production to some properties in Kern County, California; and the Best New Technology of the Midcontinent by LeNorman Energy Corporation who, with TRW, designed and installed a very successful alkali-surfactant-polymer flood in the Sho-Vel-Tum Field in Oklahoma. I know representatives are here from some of these winners. How about a round of applause for these projects.

I want to leave you with three things today. First, I want to describe our office and the program in broad terms. Second, I'll briefly mention some successes and benefits. And then I'll address a few important challenges.

NPTO Programs

Let me tell you briefly about the National Petroleum Technology Office and what we do. The National Petroleum Technology Office is the implementing arm for oil research of the Office of Fossil Energy. We are 26 people responsible for initiating and managing about \$50 million dollars a year developing

new and improved oil technology and oilfield environmental technology – technology for use by the US petroleum industry to benefit American consumers.

The role of the private sector is to make money for stockholders. The role of the Federal government is doing that work which benefits the nation that the private sector can not, will not, or should not do; work that market forces alone will not accomplish. With low oil prices for more than a decade, corporate executives have cut R&D spending dramatically to preserve profits and remain competitive. The Office of Fossil Energy fulfills the role of Federal support for oil R&D with the Federal Energy Technology Center and the National Petroleum Technology Office as its implementation arms. Indeed, taken together, DOE's upstream oil and gas programs today make up about a quarter of the total domestic upstream R&D expenditures.

As you have already heard today, the US Government is the caretaker of the largest accumulation of oil and gas properties in the country—federal lands. Onshore and offshore leases and royalties generate billions of dollars a year for the treasury without counting corporate tax revenues. Spending a very small percentage in technology development to better exploit those resources responsibly is a good investment. And it's not just federal lands: Oil and gas resources are national assets deserving of good stewardship.

Our efforts are both short and long term. During the oil price crisis this past year we shifted some more effort to short term, bottom line projects like the Technology Development with Independents solicitation and the National Association of State Energy Officials' workshops to advise operators of methods to reduce electricity and other costs. We also supported the Petroleum Technology Transfer Council in sponsoring a variety of regional workshops with practical emergency information as well as technology assistance.

But, we maintain a long term R&D focus, too, because of its critical importance to domestic petroleum operations in the future – for our energy security. The impact of the technology developments of the last few decades on this industry is incredible. It has opened new resources and reduced finding and production costs. It is essential that we continue to maintain technology leadership for the domestic industry. Otherwise domestic oil will not be able to compete and our ability to produce a precious domestic resource will be significantly compromised.

The impact of technology in the oil and gas business over the next two decades will be even more incredible.

Successes

The oil and gas industry has had many successes. Many of the recent DOE oil and gas program successes you will hear about today and tomorrow.

But if I had to pick just one recent program success still unfolding, it would be the sub-salt imaging technology that was spurred by Los Alamos National Laboratory working with a consortium of companies using defense technology. In the Gulf of Mexico this technology has allowed exploration booking at least a billion barrels of new oil reserves already. And more discoveries are on the way. The increased resolution provided by the processing algorithm has revolutionized imaging of reservoirs hidden by salt structures.

The Class Reservoir program has generated important results applicable to many producers, reducing costs and increasing reserves. Some of them are being reported here. This program has been so successful we have just had another solicitation round called the Class Revisit which closed last month. Successful proposals should be selected in a couple of months.

Perhaps the biggest success of the technology advances in the industry is also the best kept secret. New finding technologies have reduced costs. New lifting technologies have reduced costs. New processing technologies have reduced costs. All have reduced environmental impacts significantly, too – by reducing footprints with lateral drilling and multiple wells off the same pad, by reducing dry holes, by employing environmentally friendly exploration tools, by increasing efficiency and reducing waste. New technologies such as downhole separators and coiled tubing reduce cost and environmental impact. And all these finding and producing technologies enable us to remove more oil from the same reservoirs – real resource conservation. Today's industry can brag about its environmental posture.

I invite you to check our homepage (www.npto.doe.gov) for more information about all of our project results, available software and other tools.

Challenges

We face a variety of challenges to maintain the health of the industry into the future. For all the dramatic technology advances realized, much more is demanded in the future.

Improved productivity and efficiency in the E&P sector is critical to meeting the challenges of an evolving and volatile marketplace. Assistant Secretary Gee has listed many of the elements of today's business environment. So, our base program is geared to providing new and improved technologies for finding and producing petroleum and for reducing costs. We share in the risk of trying new technologies in field demonstration programs. So there is an emphasis on continuous improvement. But we need dramatic decreases in costs of operations in order to keep the domestic industry competitive and to exploit difficult reservoir targets. New ideas and bold approaches are required.

The biggest challenge we may face is the rapidly changing structure of this business. Of particular interest is the increasing move of the majors overseas to concentrate on developing the giant and more virgin fields elsewhere around the globe. One possible endpoint is that in a very few years only the independents may be left to produce the mature lower 48 domestic resources. The big service

companies will likely follow the majors. So, it could be that we will depend entirely on the independent producers and smaller service companies to maintain the flow of oil and gas from our domestic resources, with the exception of Alaska and offshore. And those groups of smaller companies are changing as fast as the majors with mergers, acquisitions, and reactions to market fluctuations. The majors would focus on their primary business interests as would the big service companies. We could experience a growing technology gap that could keep our domestic resources from being cost competitive. How would the innovative technologies needed to produce our oil and gas be developed? How would advanced technologies be transferred to the domestic industry? Market forces may work for some of an imagined shortfall, especially for gas which is absolutely necessary to meet National goals, but what about oil? How much of this gap would the government be expected to fill? Who else might provide needed R&D and technology transfer? How would new technologies be deployed? What new business structures might be developed to meet the needs of the domestic industry?

Another challenge: Some of the best remaining domestic oil and gas prospects lie on Federal lands – including wildlife refuges, national parks and seashores, and the Outer Continental Shelf. These areas are held in trust for the American people for multiple uses, however, and access is limited unless and until exploration and production technologies can provide confidence that other uses can be accommodated along with oil and gas activities. This has been especially true in the Rocky Mountain and Alaskan areas as well as the offshore. While significant improvements in environmental impacts have been made during the last two decades in the upstream industry, we must strive to achieve even lower impacts and do so with significant cost reductions. Pristine and delicate environments may require extreme measures and novel thinking to harvest their oil and gas bounty while preserving other uses.

So, to gain access to Federal lands the technical challenges are to provide less intrusive and more effective finding technologies, minimal impact drilling and completion technologies, and transport capabilities consistent with other uses. Many of these resources are found in tight or otherwise complex reservoirs. And all must be accomplished cost competitively. This is a real research and development challenge, properly pursued in part by DOE and is in the best interests of industry, government, and the public. This is also an achievable goal if we can maintain the R&D momentum that has brought us the tremendous technology advances of the last few decades.

Lastly, new environmental restrictions will further challenge the domestic oil and gas industry in the future. Whether it be air emissions from natural gas fired compressor engines or automotive emissions; whether it be water quality related to injected fluids or surface waters; or some other environmental issue related to this industry, DOE will continue to bring sound science to the regulators' discussion table and pursue new technical developments to avoid unnecessary costs while achieving a common goal of a quality environment in which to live.

So, let me close by wishing you a good conference. I encourage you to participate fully in the technical sessions of interest to you. Visit the exhibits during the conference and the poster session tonight.

Please take advantage of this conference to provide feedback to the DOE representatives to enable us to make the program more responsive to your needs. Thank you for your kind attention.